WHAT IS CLAIMED IS:

1. An apparatus for compressing a gas, comprising a fixed-volume container having a hollow and a moveable element subdividing said hollow into a first variable-volume portion and a second variable-volume portion, said second variable-volume portion having an opening for introducing therein a hydraulic and/or pneumatic fluid under pressure, for causing an increase in a volume of said second variable-portion by moving said moveable element, thereby, consequently, decreasing a volume of said first variable-volume portion and compressing a gas contained therein.

2. The apparatus of claim 1, wherein said first variable-volume portion is designed and constructed so as to be couplable during a first phase of operation to a mechanism for introducing a gas into said first variable-volume portion, and to be couplable during a second phase of operation to a mechanism for transporting a compressed gas from said first variable-volume portion to a compressed gas utilizing application, for supplying a compressed gas to said compressed gas utilizing application.

3. The apparatus of claim 2, wherein said first variable-volume portion is coupled during said first phase of operation to a source of a gas.

4. The apparatus of claim 2, wherein said first variable-volume portion is coupled during said second phase of operation to a mechanism for transporting a compressed gas from said first variable-volume portion to a compressed gas utilizing application.

5. The apparatus of claim 1, wherein said second variable-volume portion is designed and constructed to be couplable during said second phase of operation to a source of hydraulic and/or pneumatic fluid under pressure.

6. The apparatus of claim 5, wherein said second variable-volume portion is coupled during said second phase of operation to a source of hydraulic and/or pneumatic fluid under pressure.

7. The apparatus of claim 1, wherein said moveable element is constructed of a rigid material.

8. The apparatus of claim 7, wherein said moveable element is a piston.

9. The apparatus of claim 1, wherein said moveable element is at least partially constructed of a flexible material.

10. The apparatus of claim 9, wherein said flexible material is an elastomer.

11. The apparatus of claim 9, wherein said flexible material is reinforced rubber.

12. The apparatus of claim 9, wherein said moveable element is a diaphragm.

13. The apparatus of claim 9, wherein said moveable element is a bladder.

14. The apparatus of claim 13, wherein said first variable-volume portion forms a portion of said hollow and is defined by said bladder.

15. The apparatus of claim 13, wherein said first variable-volume portion forms a portion of said hollow and is defined by said fixed volume container and outside said bladder.

16. A method for compressing a gas, utilizing a fixed-volume container having a hollow and a moveable element subdividing said hollow into a first variable-volume portion and a second variable-volume portion, comprising:

(a) introducing a gas into said first variable-volume portion of said hollow during a first phase of operation; and

(b) introducing a hydraulic and/or pneumatic fluid under pressure into said second variable-volume portion of said hollow during a second phase of operation, thereby increasing a volume of said second variable-volume portion by moving said moveable element, thereby, consequently

decreasing a volume of said first variable-volume portion and compressing said gas contained therein.

17. A method for supplying a compressed gas to a compressed gas utilizing application, utilizing a fixed-volume container having a hollow and a moveable element subdividing said hollow into a first variable-volume portion and a second variable-volume portion, comprising:

(a) introducing a gas into said first variable-volume portion of said hollow during a first phase of operation;

(b) introducing a hydraulic and/or pneumatic fluid under pressure into said second variable-volume portion of said hollow during a second phase of operation, thereby increasing a volume of said second variable-volume portion by moving said moveable element, thereby consequently decreasing a volume of said first variable-volume portion and compressing said gas contained therein; and

(c) transferring a gas during said second phase of operation from said first variable-volume portion of said hollow to said compressed gas utilizing application.

18. A compressed gas utilization system comprising:

(a) a first gas compression apparatus for compressing a gas, including a fixed-volume container having a hollow and a moveable element subdividing said hollow into a first variable-volume portion and a second variable-volume portion, said second variable-volume portion having an opening for introducing therein a hydraulic and/or pneumatic fluid under pressure, for causing an increase in a volume of said second variable-volume portion by moving said moveable element, thereby consequently decreasing a volume of said first variable-volume portion and compressing a gas contained therein;

(b) a compressed gas utilizing application utilizing compressed gas; and

(c) a first mechanism for transporting a compressed gas from said first variable-volume portion of said first gas compression apparatus to said compressed gas utilizing application.

19. The system of claim 18, wherein said first mechanism for transporting a compressed gas comprises a valve for controlling flow of gas.

20. The system of claim 18, wherein said first mechanism for transporting a compressed gas comprises a gas manifold.

21. The system of claim 18, wherein said first mechanism for transporting a compressed gas comprises a control module for controlling said transporting of compressed gas.

22. The system of claim 21, wherein said control module comprises a feedback sensor.

23. The system of claim 22, wherein said feedback sensor is a temperature sensor.

24. The system of claim 22, wherein said feedback sensor is a pressure sensor.

25. The system if claim 22, wherein said feedback sensor is a mass flow sensor.

26. The system of claim 21, wherein said control module comprises a processor and a memory, said processor being operable according to a set of programmed instructions stored in said memory.

27. The system of claim 21, wherein said control module comprises a console for receiving commands from a user.

28. The system of claim 21, wherein said control module comprises a remote command module incorporating a telecommunications device.

29. The system of claim 21, wherein said control module comprises a remote command module incorporating an infrared communications device.

30. The system of claim 18, wherein said first variable-volume portion of said first gas compression apparatus is coupled during a first phase of operation to a mechanism for introducing a gas into said first variable-volume portion of said first gas compression apparatus, and said first variable-volume portion of said first gas compression apparatus is coupled during a second phase of operation to said mechanism for transporting a compressed gas from said first variable-volume portion of said first gas compression apparatus to said compressed gas utilizing application.

31. The system of claim 30, further comprising:

(d) a second gas compression apparatus including a fixed-volume container having a hollow and a moveable element subdividing said hollow into a first variable-volume portion and a second variable-volume

portion, said second variable-volume portion having an opening for introducing therein a hydraulic and/or pneumatic fluid under pressure, for causing an increase in a volume of said second variable-volume portion by moving said moveable element, thereby consequently decreasing a volume of said first variable-volume portion and compressing a gas contained therein; and

(e) a second mechanism for transporting a compressed gas from said first variable-volume portion of said second gas compression apparatus to said compressed gas utilizing application.

32. The system of claim 31, designed and constructed so as to enable said first gas compression apparatus to be in said first phase of operation while said second gas compression apparatus is in said second phase of operation, and said first gas compression apparatus to be in said second phase of operation while said second gas compression apparatus is in said first phase of operation.

33. The system of claim 32, designed and constructed so that said first gas compression apparatus is in said first phase of operation when said second gas compression apparatus is in said second phase of operation, and said first gas apparatus is in said second phase of operation when said second gas compression apparatus is in said first phase of operation.

34. A cryosurgery system comprising:

(a) a first gas compressor for compressing gas;

(b) a cryoablation apparatus utilizing compressed gas; and

(c) a mechanism for transporting compressed gas from said gas compressor to said cryoablation apparatus during use.

35. The system of claim 34, wherein said cryoablation apparatus comprises a Joule-Thomson heat exchanger for cooling a portion of said cryoablation apparatus.

36. The system of claim 35, further comprising:

(d) a mechanism for re-pressurizing a gas depressurized by use in said Joule-Thomson heat exchanger.

37. The system of claim 36, further including a mechanism for transporting a gas depressurized by use in a Joule-Thomson heat exchanger from said cryoablation apparatus to said gas compressor.

38. The system of claim 37, wherein said mechanism for transporting a gas includes a second gas compressor.

39. The system of claim 37, wherein said mechanism for transporting a gas includes a gas reservoir.

40. The system of claim 34, wherein said gas compressor comprises a fixed-volume container having a hollow and a moveable element subdividing said hollow into a first variable-volume portion and a second variable-volume portion, said second variable-volume portion having an opening for introducing therein a hydraulic and/or pneumatic

fluid under pressure, for causing an increase in a volume of said second variable-volume portion by moving said moveable element, thereby consequently decreasing a volume of said first variable-volume portion and compressing a gas contained therein.

41. The system of claim 40, wherein said first variable-volume portion of said first gas compression apparatus is coupled during a first phase of operation to a mechanism for introducing a gas into said first variable-volume portion of said first gas compression apparatus, and said first variable-volume portion of said first gas compression apparatus is coupled during a second phase of operation to said mechanism for transporting a compressed gas from said first variable-volume portion of said first gas compression apparatus to said compressed gas utilizing application.

42. A method for cryosurgery, involving *in situ* compression of gas, comprising:

(a) using a first *in situ* gas compressor to compress a gas, thereby transforming said gas into a first compressed gas at a first gas pressure;

(b) transferring said first compressed gas at said first gas pressure from said first gas compressor to a cryoablation apparatus utilizing said first compressed gas at said first gas pressure; and

(c) using said cryoablation apparatus to perform cryoablation, thereby creating a decompressed gas at a second gas pressure.

43. The method of claim 42, further comprising:

(d) transferring said depressurized gas at said second gas pressure to said first gas compressor, for recompression and reuse; and

(e) recompressing and reusing said depressurized gas.

44. The method of claim 42, further comprising:

(d) transferring said depressurized gas at said second gas pressure to a second gas compressor, for recompression and reuse; and

(e) recompressing and reusing said depressurized gas.